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Effect of Bank-Based or Market-Based Financial Systems on Income Distribution in Selected Countries

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Abstract

The main goal of this research is to estimate the effect of bank-based and market-based financial systems on income distribution using the data of 15 developed and developing countries. For this purpose, firstly the type of financial system for selected countries was determined. Then the model of research was estimated applying the FMOLS method. In the next step, using OLS method in panel data, the effect of the type of financial system on income distribution of the two groups of developed and developing countries was estimated in order to come up with a better conclusion. The results indicated that the type of financial system affects income distribution. Market-based financial system leads to better income distribution in developed countries, while bank-based financial system reduces income inequality in developing countries.

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Keywords: Income Inequality; bank-based financial system ; market-based financial system ; FMOLS method

1. Introduction

Income distribution is one of the important economic topics. Income distribution means dividing national gross product among production elements that participated in forming and creating added value of the company and in other words, income distribution in economy expresses how national income is divided among social groups and classes and what the performance of the economic system is. Although the topic of income distribution and poverty are traditionally within the framework of micro-economy, it is vastly analyzed in the area of macro-economy

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nowadays. Historical evidences and experiences of different countries show that many factors are effective on the economic inequality level. These factors could be divided into economic growth development, demographical, political, historical, cultural and natural factors and macro-economic factors (Kassa ,2001).
Considering the importance of income distribution in national economy, study of the effect of financial system on income distribution in every economy is important. Thus this research studies the effect of the type of financial system on income distribution. The purposes of this study are to identify whether the financial system of the selected countries is bank-based or market-based and specifically to find out the effect of the financial system of the selected countries on their income distribution.

1.1. Description and statement of research

Studies were conducted in the area of financial development and economic growth that indicate the positive effect of financial development on economic growth. Development of financial systems is in form of a set of institutions and organizations that deal with transfer of money and is in charge of mediation of saving and investing money. Meanwhile all countries have such a system, but comparative study of these systems indicates a considerable structural variation among them. The most important aspect of this variation is whether these systems are bank-based or market-based.

Financial system could be bank-based, securities-based and financial services-based. The bank-based theory emphasizes on the positive role of banks in economic growth and development and shortcomings and failures of the securities-based financial system. According to this theory in developing countries, banks could be more effective than market of securities on the economic growth. The view of being bank-based also emphasizes on the shortcomings and failures of the basis system among which the following point could be referred to that securities - based system has issued the information for the public and in this way it reduces the investors' incentive to seek information. On the other hand, banks remove the disturbances resulting from unbalanced information through establishment of a long-term relation between themselves and firms. As a result, bank-based arrangements could improve the optimal allocation and company governance more than the securities-based systems. Furthermore, securities-based theory explains the advantages of better performance of the market and emphasizes on the problems of the bank-based system.

1.1.1. Relation between Financial Development and Income Distribution

Economic theories show that financial development affects income distribution from different channels. There are two approaches regarding the relation between financial and inequality development that are presented in two different schools. One school was presented by (Greenwood and Jovanovic, 1990) which proves that the relation between financial development and inequality is in form of a reverse U and the second school that was introduced by Benergy and Newman, 1993 and Guller and Zira, 1993 indicates that there is a linear relation between financial and inequality development.

2. Literature Review

2.1. Financial System

Financial market is an official and organized market where funds are transferred from individuals and units that have additional financial resources to individuals and units requiring resources (funds). It goes without saying that in this market, the majority of loan grantors are families and the majority of applicants for these loans are economic firms and government. Financial market facilitates the necessary basis for transfer of savings from natural persons or legal entities to other individuals who hold the creative investment opportunities and require financial resources. The mentioned transfer of funds leads to creation of financial properties almost in all cases and is in fact a claim for future incomes of an individual (legal entity) who has issued the negotiable papers of stock exchange (Shabahang ,1996)

Economists have many differences and disputes over the advantages and disadvantages of bank-based financial systems against market-based ones. In bank-based financial systems, banks have the central role to mobilize savings, allocate capital, supervise the investment decisions of the firm directors and present different tools for risk management. In market-based financial systems, the market of financial categories participates with the bank regarding allocation of deposits and savings to firms and facilities the risk management process. Theoreticians of market-based approach emphasize that powerful banks prevent innovation in most cases by receiving the information and support of old firms. Eventually supporters of market-based theory believe that the government banks show less inclination to resolve the market differences and are mostly inclined to reach the political objectives. This theory finds it more likely that the government banks push the resources more toward human resources-based industries than the strategic industries (Schleifer , 1997) Thus some theories emphasize that markets have reduced the negative effects of the power of big banks and promote the research-based and innovative industries in economy (Allen , 1993) Furthermore, banks and markets might complete the financial system together as they present financial services(Huybens & smith,1999)

Studies of the financial system of different countries conclude that in the countries that have high income, stock exchange market operates more actively and efficiently than the banks. As the countries become wealthier, they are more inclined to move toward market-based financial systems. Countries that have good accounting regulations, strong legal rules regarding support for shareholders' rights and the degree of low bribery are inclined to move toward market-based financial systems. Also the countries that have weak regulations regarding support for shareholders' rights, high bribery, weak accounting standards, restricting banking regulations and high inflation are inclined to move toward bank-based financial systems.

Three Indexes are defined to assess the financial system as follows:

2.1.1. Structure-Activity Index

This Index measures the volume of the activity of capital markets with regard to the banks. In order to measure the volume of activities of the capital markets, the total ratio of the value of exchanged shares in stock exchanges divided by GDP is used. This ratio measures the volume of market exchanges over the total economic activities. On the other hand, to measure the volume of activity of the banks, the banking credits ratio was used which is equal to the credits granted by commercial and specialist banks to private sector divided by GDP. To calculate this Index, the granted credits to the governmental sector were not considered. The Index of activity system is equal to logarithm of the exchanged shares divided by the ratio of banking credits. (Equation 1)

$$SA = \text{Ln}\,(STV/PCB) \tag{1}$$

Where:

SA: Structure-Activity Index

STV: Ratio of the total value of exchanged shares divided by GDP

PCB: Credits granted by banks to the private sector divided by GDP

If the amount of this Index is positive, it will show that the fraction is bigger than 1 and the financial system is market-based.

2.1.2. Structure-Size Index

This Index shows the size of the capital market in comparison with the banks. To calculate the size of capital market, market value ratio is used which is equal to value of shares of all the companies recognized by Stock Exchange Market of one country divided by GDP. Also to assess the size of banking system, the ratio of granted credits by banks to private sector divided by GDP is used. Thus, the Structure-size Index is equal to logarithm of the ratio of capital market divided by the ratio of banking credits. (Equation 2)

$$S.S = \text{Ln}\,(MTG / PCB) \tag{2}$$

Where:
SS: Structure-Size Index
MTG: Total value of shares market divided by GDP
PCB: Credits granted by banks to the private sector divided by GDP
If the amount of this Index is positive, it will show that the fraction is bigger than 1 and the financial system of the country is market-based.

2.1.3. Structure-Efficiency Index

This capital market efficiency Index shows that in order to assess capital market efficiency, ratio of the value of exchanged shares divided by the total value of the capital market is used in comparison with the banking system. That is because this ratio shows the degree of cash capital market. To calculate the efficiency of the banking sector, overhead costs were used which are equal to the ratio of overhead costs of the banking system divided by properties of the banking system. The high overhead costs show the inefficiency of the banking system. Levin used gap of interest rates in his study. Considering the fact that the marginal information of interest rates does not exist for the entire sample countries, the overhead costs are used in this study. The efficiency system Index is as follows.(equation 3)

$$S.E = \mathrm{Ln}\,(STO \times Ovc) \tag{3}$$

Where:
SE: Structure-Efficiency Index
STO: Ratio of the total value of exchanged shares divided by the total value of market shares
Ovc: overhead costs of banking system divided by banking properties

Means removed average of the three above indexes is calculated for every country and every year to acquire financial structure of considered countries.
According to the results of the calculations, in the years when the Index of the financial system was negative, the financial system was bank-based and in the years when the Index was positive, the financial system was market-based. It is worth mentioning that due to the lack of access of the author to data of banking overhead costs regarding Iran, the Index of financial system lacks efficiency system Index in Iran and it was calculated by the average of two Indexes of activity system and efficiency system.

2.2. Research History

Kunt and Levine investigated the differences between financial systems in countries. Their study indicated that the more the incomes of a country increases, the vaster the banks and shares markets and mediatory financial institutions expand. In other words, the country will develop financially. Furthermore by studying the different income groups, they found out that in the countries that have high income, securities market is more active and efficient in comparison with the banks and in the countries that have high income, financial structure is inclined to be market-based.

Kunt, Feyen and Levine, studied firstly the importance of banks and financial markets in the development process and secondly the relation between financial system (being bank-based or market-based) and economic development. Findings of their research showed that the more an economy is expanded, the more important the services are that are presented by the financial markets in comparison with the banks. (Demirguc et al, 2011)

Jovanovic and Greenwood showed that the economic growth and financial development are interrelated.' In practice, when transferring from a basic economy with low growth to a society with high economic growth, a nation will go through a stage where the gap of wealth distribution increases between the affluent and the poor (Greenwood and Jovanovic, 1990)

Levine studied the effect of financial systems using temporary data of the selected countries. The results of his study indicated that although financial development is strongly related to economic growth, being bank-based or market-based has no significant effect on this approach (Levine , 2002)

Rajan & Zingales found out that the market-based financial system is more successful when the industrial structures change and the bank-based financial system has advantage when the other existing organizations or institutions in economy expand in a paper under the title of 'financial systems, industrial structures and growth' (Rajan & Zingales. 2003)

Clarke et al studied the effect of financial development on income inequality using panel data from both developing and developed countries between 1960 and 1995. They found out using OLS method that in the countries owning more advanced financial system, inequality is less and also income inequality reduces at the same time the markets expand and financial mediators reduce. Therefore, their experimental results supported strongly the linear hypotheses raised by Benergy and Newman, Guller and Zira. (Clarke et al, 2003)

Beck, Kunt and Levine investigated the effect of financial development on poverty and inequality in different countries. The results of their study showed that financial development is actually inclined to poverty. The granted credits by the financial mediators to the private sector and to the GDP were considered as financial development Index in this study. They also showed in the study that in the countries that have vaster financial mediators, the income of the lowest group has grown more rapidly than the average GDP per capita and the income inequality also reduces more rapidly (Beck et al, 2004)

Using OLS method and GMM technique of the provincial data of China between 1986 and 2000, Liang indicated that there is a negative and linear relation between financial development and income inequality in the two urban and rural areas and that the relation of reverse U-shaped between financial development and inequality is weak (Liang, ,2006)

Manoel and Bittencourt studied the effect of financial development on income inequality in Brazil between 1985 and 1994. They found out that the financial development and expansion of financial institutions in Brazil has a strong and significant effect on income inequality during the studied period, but this does not mean the poor people could use this financial development because factors such as increased rate of inflation prevents the poor people from entering into the markets (Manoel and Bittencourt, 2006)

Using OLS method and GMM technique, Canavire and Rioga studied the financial development and income distribution. The research results showed that not only financial development leads to economic growth, but also it leads to increased income distribution and the return of all types of income. Also this study confirmed Greenwood's idea, i.e., positive effect happens only when the country is on the eve of certain economic development (Canavire, 2008).

Batuo et al studied the relation between financial development and income distribution. Using temporary data from 22 African countries between 1990 and 2004 and GMM method, the results of their estimations showed that when the countries expand their financial sector, income inequality reduces which is the result of theoretical bases and former studies. The results of their studies also did not show any proofs regarding the reverse U-shaped relation between financial development and inequality (Batuo et al, 2010)

Kappel studied the effect of financial development on income inequality and poverty using panel data and OLS method between 1960 and 2006 for 78 developed and developing countries. He found out in the countries with high income, the government's costs lead to reduction of income inequality and no significant factor was found in low-income countries (Kappel, 2010).

Jauch and Watzka studied the relation between financial development and income inequality for 138 developed and developing countries between 1960 and 2008 using OLS method. The results of the study show that contrary to the existing theories, financial development leads to deterioration of income inequality (Jauch, and Watzka, 2011)

3. Methodology

To evaluate the research model to find out whether the type of financial system is effective on income distribution or not, three models of economic assessment were estimated.

- Firstly in this model, a general model estimates the effect of the type of financial system on income distribution where the type of financial system is assessed using virtual variable in the model.
- Secondly, since the selected countries are different as far as the volume of economy and the state of development are concerned, the countries were divided into two groups of being 'developed' and being 'developing' to obtain

more precise and efficient results and separately the effect of their type of financial system on income distribution was estimated.

3.1. Model

The used model is as follows:

$$\text{Gini} = f(\text{UN}, \text{FD}, \text{Openness}, \text{INF}, \text{S}) \quad (4)$$

Where the variables are defined in it as follows:
Gini: Gini Coefficient as the income inequality Index.
INF: INF is the rate of inflation.
UN: UN is the rate of unemployment
Openness: Openness is the rate of openness of the economy (ratio of exports and imports divided by GDP).
S shows the financial system. The positive amounts show the market-based financial system and the negative amounts show the bank-based financial system. In this study, dummy variable was used to estimate the effect of financial system. In this way, the dummy variable was used to estimate the state of being bank-based or market-based of economy. In the years when the system was market-based, the figure was considered as one and in the years when the studied state system was bank-based, the figure was considered as zero.

FD is the degree of development of the financial system, for example, the level of development of the banks, non-banking institutes and stock market. The bigger FD is, the higher level of financial services it shows. The Indexes of financial development show the financial services in an economy which is presented by financial mediators including banks and capital market. The Index of financial deepening is the most common and at the same time the simplest Index for financial development and it was used in the studies by Goldsmith in 1969 and McKinnon in 1973 for the first time. This Index indicates the ratio of the size of official financial mediators over the economic activities. The financial deepening Index is the ratio of liquidity divided by GDP.

3.2. Economic Assessment Method

Methodology of economic assessment that was used in this study consisted of several main parts. Firstly the integration degree for series is determined by Panel Unit root tests. In the second step, the introduced co-integration techniques introduced by (Pedroni, Fully Modified OLS for heterogeneous cointegrated panels) to determine the existing co-integration relations were used. Thirdly, in the cases where our series were co-integrated, we estimated the existing co-integration vector among them using Fully Modified OLS (FMOLS) method according to the introduced method by Pedroni. In cases where co-integration did not exist, OLS was estimated.

3.2.1. Fully Modified OLS (FMOLS) Method

This method estimates co-integration vector. FMOLS applies two external and internal corrections using OLS method. Also the results of the studies show that FMOLS results present more efficient results in small samples in comparison with Johneson method, 1988. On the other hand, the advantage of this method in comparison with ML method of Johnson is that it is not affected by the length of pause. While the obtained results from Johnson are strictly based on selection of optimal pause. Also Phillips, 1991 showed that FMOLS estimation like Johnson method, 1988 is efficient on its own under the conditions of all internal variables. Hence this method could be used to make an optimal estimation of co-integration vector. (Dahmardeh et al,2010)

3.2.2. Panel Unit Root Test

Before conducting co-integration test to determine the long-term relation among the variables in question, panel unit root test was conducted for the variables. The literature of economic assessment and unit root explain that the unit root test based on panel data in comparison with unit root test of temporal series has more power and authenticity. In this research, three types of different unit root tests were used to study the persistence of variables.

These tests were Levin, Lin et al (it is referred to as LLC hereafter), Augmented Dickey Fuller test (it is referred to as ADF hereafter), IM, Pesaran et al (it is referred to as IPS hereafter) which were used. The main assumption of LLC test is the existence of one unit root process among the sections, while IPS test has provided this possibility that heterogeny exists among individual effects and for this reason IPS test is called Heterogeneous Panel Unit Root Test. The results of the unit root estimations for the variables are reported in the tables 1, 2, 3.

Table 1. Results of IPS test for all the selected countries-Source: Research findings

Without coefficient ship and trend		With coefficient ship and trend			With coefficient ship			Description
ADF	LLC	ADF	IPS	LLC	ADF	IPS	LLC	IPS Variable
31.1646	0.51070	63.8008**	-2.25139***	-7.71269***	41.0149*	-0.52881	-2.11920**	Gini
23.3140	4.27742	54.0438**	-2.04156***	-4.95462***	44.2800**	-0.54154	-1.24189*	FD
137.152**	-8.86384**	60.5250**.	-2.37887***	-6.99607***	71.7615***	-4.29674**	-6.18082**	SI
29.7059	-2.06640**	48.2343**	-1.73684***	-9.84006***	61.7530**	-3.50433**	-6.40221**	UN
18.2596	-0.37552	33.6172	-0.55558***	-4.58441***	32.8198	0.81191	-3.40884**	Open
33.9268	-0.94781	53.4625***	-1.98495***	-7.01443***	71.2745***	-3.78712**	-5.05260**	Inflation

Optimal pause was selected according to modified Schwartz Index. H0 tested by the unit root test is the existing unit root in temporal series. *, ** and *** respectively indicate the significance at different levels of probability of 90%, 95% and 99%.

Table 2. Results of IPS test for developed countries -Source: Research findings

Without coefficient ship and trend		With coefficient ship and trend			With coefficient ship			Description
ADF	LLC	ADF	IPS	LLC	ADF	IPS	LLC	IPS Variable
2.34003	1.45681	29.0791**	-2.03333**	-5.90474***	29.3548**	-2.46956**	-3.38249**	Gini
18.9419*	1.73679	40.7110**	-43.4321***	-85.4727***	20.8683*	-5.88362**	4.61275	FD
67.6442***	7.04505***	30.7104**	-2.10274**	-6.21121***	36.9683**	-3.75560**	-5.23637***	SI
6.80571	-0.50394	31.1260**	-2.14138**	-10.0412***	35.9608***	-3.64769***	-7.15588**	UN
5.44820	0.21886	15.9529	-0.80102	3.21632**	9.37732	0.20629	-1.17316	Open
19.7204**	-2.15668**	25.1452**	-2.17420**	-6.28825**	34.0174**	-3.61942***	-6.20167**	Inflation

Optimal pause was selected according to modified Schwartz Index. H0 tested by the unit root test is the existing unit root in temporal series. *, ** and *** respectively indicate the significance at different levels of probability of 90%, 95% and 99%.

Table 3.Results of IPS test for developing countries -Source: Research findings

Without coefficient ship and trend		With coefficient ship and trend			With coefficient ship			Description
ADF	LLC	ADF	IPS	LLC	ADF	IPS	LLC	IPS Variable
28.8245*	-0.05854	38.3248**	34.7217**	-1.30484*	11.6602	1.13482	-1.00125	Gini

35.0383**	-0.29820	91.8837***	-68.2997***	-169.463***	52.7070	-28.5137**	-32.2107**	FD
69.5078***	-5.82002**	29.8146**	-1.29931*	-3.83847***	34.7933**	-2.43105**	-3.82181**	SI
22.9001	2.07298**	17.1083	-0.12526	-2.72276**	25.7922	-1.44396*	-3.05952**	UN
12.8113	-0.71061	17.6643	-0.03258	3.46653***	23.4425	-1.20297	-3.12279**	Open
22.9959	-0.09786	28.3173*	-1.00818	-4.60613***	37.2571**	-2.01446**	-3.27049**	Inflation

Optimal pause was selected according to modified Schwartz Index. H0 tested by the unit root test is the existing unit root in temporal series. *, ** and *** respectively indicate the significance at different levels of probability of 90%, 95% and 99%.

According to the results from the above tables, the evidences resulting from conducting different tests mainly indicated the existence of a unit root at 99% level of certainty for the amounts of the variables at the level. On the other hand, the assumption of unit root existing for the subtraction of the above-mentioned variables is rejected strongly. The results indicate the existence of co-integration of order one for the variables.

3.2.3. Panel Co-Integration Tests

If the test results of unit root indicate that the co-integration variables are of order one, in the next step, the test for the existence of long-term balance relations among variables is studied. Considering the heterogeny in the dynamisms and variance of error sentences, our panel is introduced using co-integration test of the panel introduced by Pedroni to facilitate the study of such heterogenies in the panel models because this test facilitates the heterogeny in coefficient ship and slope of co-integration equation. Pedroni's co-integration test is estimated of the wastes and uses long-term regression. Pedroni studied seven different statistics in two distinct groups for study and the test of H0 based on absence of co-integration vector in heterogeneous panel models. Group one is known as being internal and considers temporal factors. The other group is called Panel Y -statistic that facilities heterogeny among countries. The seven statistics that Pedroni introduced for co-integration test are as follows:

The first group is the intra-test statistics:

- Panel Phillips-Perron type r-statistics Y
- Panel Phillips-Perron type t-statistic ρ
- Augmented Dickey-Fuller (ADF) type t-statistic
- Group Phillips-Perron type r-statistic

The second group is the inter-test statistics:

- Group Phillips-Perron type t-statistic ρ
- Group Phillips t-statistic
- Group ADF type t-statistic

For intra-test statistics, H0 is based on absence of testable co-integration according to the wastes.

The results from the estimation of the above relations are shown in table 4.

Table 4.Results of co-integration test using seven different statistics for all the selected countries

Total selected countries		Group of countries
With coefficient ship and trend	Without coefficient ship and trend	Test statistic
-4.118175	-1.465097	Panel statistic Y
2.609219	4.321446	Phillips-Perron type Panel ρ statistic
2.555260**	-5.993178***	Phillips-Perron type Panel t statitic
2.518781**	-3.822941***	Augmented Dickey-Fuller type panel statistics

		Among dimensions
4.697954	5.889818	Group Phillips-Perron ρ statistic
-6.163462***	-14.22637***	Group Phillips-Perron t statistic
-2.915815***	-4.756817***	Group ADF type t statistic

*, ** and *** signs are respectively representing significance of coefficients at 10%, 5% and 1%. (source: research findings)

Table 5 represents the Results of co-integration test using seven different statistics for all developed countries.

Table 5.Results of co-integration test using seven different statistics for all developed countries

Developed countries		Group of countries
With coefficient ship and trend	Without coefficient ship and trend	Test statistic
-2.865132	-2.807766	Panel statistic Y
2.359253	3.478307	Phillips-Perron type Panel ρ statistic
0.923960	-7.256374***	Phillips-Perron type Panel t statitic
0.871005	-1.590241*	Augmented Dickey-Fuller type panel statistics
		Among dimensions
		Group Phillips-Perron ρ statistic
3.422761	4.174850	Group Phillips-Perron t statistic
-0.80374	-5.473825***	Group ADF type t statistic

*, ** and *** signs are respectively representing significance of coefficients at 10%, 5% and 1%. (source: research findings)

Table 6 outlines the results of co-integration test using seven different statistics for developing countries.

Table 6. Results of co-integration test using seven different statistics for developing countries

Developing countries		Group of countries
With coefficient ship and trend	Without coefficient ship and trend	Test statistic
-3.366025	-0.712570	Panel statistic Y
3.014280	3.458285	Phillips-Perron type Panel ρ statistic
2.216228	-2.489391**	Phillips-Perron type Panel t statistic
2.437453	-1.583781*	Augmented Dickey-Fuller type panel statistics
		Among dimensions
4.385266	4.815307	Group Phillips-Perron ρ statistic
-0.734181	-6.494553***	Group Phillips-Perron t statistic

*, ** and *** signs are respectively representing significance of coefficients at 10%, 5% and 1%. (Source: research findings)

Considering the results from co-integration tests, four test statistics regarding all the selected countries confirm the co-integration vector for the two groups of countries as indicated by H0. Thus, it is concluded that there is a

long-term relation between tested variables in the total group of the selected countries and the results of estimating the general model will be presented according to FMOLS method, but among the developed or developing countries, H0 cannot be rejected indicating lack of co-integration or lack of long-term relation, hence to estimate the minor models that are used to assess the effect of the bank-based or market-based financial system on income distribution, particularly for developing and developed countries, OLS estimation was used, and for this purpose, firstly the results of Flimer and Hausman tests which mean selecting pool and panel methods respectively and selection between the two methods of fixed and random effects were presented and eventually the results of the estimation for all groups will be shown.

3.2.4. Model Estimation

In the beginning of this section, the results of Flimer and Hausman tests are presented.(Tables 7,8)

Table 7.Results of Flimer and Hausman tests of developed countries-source: Research findings

Type of test	Statistic	Possibility	Result
Flimer	69.704643	0.0000	Panel method was approved
Hausman	348.523213	0.0000	Fixed effect model was approved

Table 8.Results of Flimer and Hausman tests of developing countries-source: Research findings

Type of test	Statistic	Possibility	Result
Flimer	118.828275	0.0000	Panel method was approved
Hausman	5.693018	0.3372	Random effect model was approved

The results of general model estimation using FMOLS method and description of minor models of the research are given as follows.(Tables 9,10).

Table 9. Results of model estimation using FMOLS method-Research findings

Probability	t statistic	Criterion deviation	Estimated coefficients	Variable
0.0400	2.076249	0.040519	0.084128	Inflation
0.0946	1.685241	0.163470	0.275487	UN
0.0308	2.185403	0.475974	1.040195	D1
0.0031	-3.021747	0.032906	-0.099432	Openness
0.0054	2.836451	0.023042	0.065358	FD

R^2: 0.97

Table 10. Results of minor models estimation -Research findings

Description of minor models				variables
Random effect model		Fixed effect model		
Developing countries		Developed countries		Group of countries
t statistic	Coefficient	t statistic	Coefficient	Gini-based variable
1.305084*	0.652558	-0.467867*	-0.110654	D1

4. CONCLUSION

The results show estimation of FMOLS model that indicates there is a positive and significant relation between financial system and Gini Coefficient. This means that the increased market-based quality in the set of selected countries increases the Gini Coefficient. Considering the R^2 statistic (equal to 0.97), independent variables of the

model explain 97% of the changes of Gini Coefficient. In addition, the estimated model has an acceptable F statistic. All the coefficients of the model except unemployment are at the significance level of 95% and unemployment is statistically at the significance level of 90%. The results also show the following:

- Increased unemployment, inflation, financial system and financial development results in increased Gini Coefficient. This means that every 1 unit increase in inflation and unemployment increases the inequality level by 0.08 and 0.2 units and the increased economic openness Index and or globalization reduces Gini Coefficient.
- It is noticed that financial system shows the highest effect among independent variables on dependent variable (Gini Coefficient) and the sign of all the variables except financial development corresponds with the theory and meets the expectations. It also confirms that there is a linear relation between financial development and income distribution
- In minor models that were developed to know the sign of prominent coefficients of the financial system for the two groups of developed and developing countries, despite the negative sign of the prominent coefficient of the financial system in the model estimated for the developed countries and vice versa, the positive sign of this coefficient is considered for the developing countries. In fact the market-based financial system in developed countries reduces Gini coefficient and in return in the group of developing countries, the market-based financial system increases this coefficient. Thus in the developing countries, reinforcement of bank-based financial system and in the developed countries, reinforcement of market-based financial system should be taken into consideration to improve income distribution.

Appendix A. Tables 11

Table 11. Results of financial structure Index for selected countries (source: Research findings)

	financial structure															
Count-ry /year	ARG	BRA	EGY	FRA	DEU	IND	IDN	IRN	JPN	KOR	MYS	NLD	PAK	ZAF	TUR	US
2000	0.03	-0.06	-0.12	0.13	0.03	0.14	-0.28	-0.42	-0.11	0.19	0.09	0.17	-0.05	-0.14	0.23	0.16
2001	0.07	-0.17	-0.61	0.07	0.09	-0.15	-0.39	-0.41	-0.20	-0.10	-0.18	0.23	-0.34	-0.22	-0.02	0.09
2002	-0.2	-0.31	-0.58	-0.019	-0.03	-0.23	-0.30	-0.19	-0.22	-0.08	-0.13	-0.01	-0.02	-0.16	-0.13	0.01
2003	-0.01	-0.15	-0.49	-0.02	-0.06	-0.07	-0.23	0.11	-0.11	-0.12	0.02	-0.01	0.24	0.06	0.05	-0.14
2004	0.09	-0.04	-0.23	-0.01	-0.06	-0.03	-0.04	0.31	-0.01	-0.06	0.05	0.04	0.22	0.04	0.08	-0.10
2005	0.33	-0.01	0.27	-0.02	-0.01	-0.01	0.06	0.11	0.12	0.09	-0.03	-0.04	0.40	-0.00	-0.20	-0.10
2006	0.01	0.07	0.40	0.13	0.11	0.07	0.10	-0.06	0.23	-0.15	0.05	-0.09	0.30	0.12	0.13	-0.01
2007	0.14	0.28	0.50	0.15	0.19	0.23	0.36	-0.06	0.26	0.10	0.26	0.29	0.24	0.17	0.11	0.04
2008	0.17	0.04	0.38	-0.03	0.05	0.01	0.17	0.08	0.11	-0.09	-0.07	-0.12	-0.18	0.09	-0.18	0.09
2009	-0.29	0.18	0.25	-0.20	-0.17	0.06	0.27	0.12	-0.02	0.09	-0.05	-0.23	-0.32	0.08	-0.07	0.04
2010	-0.36	0.15	0.10	-0.18	-0.11	-0.00	0.28	0.40	-0.02	0.14	0.00	-0.22	-0.49	-0.03	0.02	-0.07

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